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08/941,170 09/30/97 MCFARLAND

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EXAMINER

HM12/1116

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ART UNIT

PAPER NUMBER

1627

DATE MAILED:

11/16/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/941,170

Applicant(s)

McFarland et al

Examiner

P. Ponnaluri

Group Art Unit

1627



☒ Responsive to communication(s) filed on Sep 1, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1, 5-15, 24, 25, and 41-57 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 5-15, 24, 25, and 41-57 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 7, 23

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

NOTE: The examiner in this application has changed.

1. This application claims priority to provisional application 60/027,245.
2. Applicant's election of group I, claims 1, 5-15, and 41-57 in Paper No. 25, filed on 9/1/00 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
3. Claim 2 has been canceled by the amendment filed on 3/22/99; and Claims 3-4, 16-23, 26-38, 58-61 have been canceled by the amendment filed on 12/14/99; and claims 39-40 and 62-69 have been canceled by the amendment file don 9/1/00. Claims 1, 5-15, 24-25, 41-57 are currently pending in this application.
4. Claims 24-25 were inadvertently not included in the group I, during the restriction mailed on 7/28/00. Thus, the elected group I has claims 1, 5-15, 24-25 and 41-57.
5. Claims 1, 5-15, 24-25 and 41-57 are currently being examined in this application.
6. The new matter rejections set forth in the previous office action has been withdrawn in view of applicants arguments.
7. Applicant's arguments with respect to claims 1, 5-15, 24-25 and 41-57 have been considered but are moot in view of the new ground(s) of rejection.

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8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1, 5-15, 24-25 and 41-42 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

The newly amended (12/12/99) claim 1 recites ‘...thereby to deposit different amounts of the components simultaneously at the predefined region...’.

The newly added limitation ‘different amounts of the components simultaneously at the predefined region’ claimed in claim 1 has no clear support in the specification and the claims as originally filed. The specification in page 12, lines 22-24 (as stated by the applicants in the response) does not support for this limitation. The specification disclosure enables only ‘deposition of the components simultaneously’. The subject matter claimed in claim 1 alters the scope of the invention as originally disclosed in the specification.

If applicants disagree, applicant should present a detailed analysis as to why the claimed subject matter has clear support in the specification.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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11. Claims 1, 5-15, 41-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites ‘...applying components of one or more source materials to at least two predefined regions an a substrate.....’ It seems to be ‘an a’ is supposed to be “of a”. Applicants are requested to amend the claim.

Claim 1 recites the limitation "the components" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites ‘at least a portion of the substrate’ and ‘at least a portion of the substrate is immersed’, which is indefinite because it is not clear which portion of the substrate has the housing and which portion of the substrate is immersed. Does the portion of the substrate with the housing is immersed? Applicants are requested to clarify.

Applicants have amended claims 1, 5-15, 24-25 and 41-42 to recite that the electrical potential causes “the components of the source materials to undergo chemical reaction at the predefined regions and thereby to deposit different amounts of the components simultaneously at the predefined regions” This is vague and indefinite because it is unclear if all components of the source material must undergo reaction and deposit at the predefined region or if only some components must deposit. Or only one component need be applied, if no components is applied in one region and a components is applied in a different region, are the components of the regions

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different? Therefore, it is not possible to determine the metes and bounds of the invention as claimed.

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

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made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1, 5, 8-13, 15 24-25, 43-45, 48 and 50 are rejected under 35 U.S.C. 102(b) as anticipated by Liu et al [US 4,988,412].

Liu et al disclose an apparatus and method in which different inorganic materials (metals) are electrodeposited using an electrolytic bath to deposit on a substrate in different regions. Different components of the source materials (see the abstract, the figures and the summary of the invention). Note that as the apparatus must contain an anode and a cathode at least one other electrode must be present. Therefore, Liu et al anticipates the invention of independent claims 1 and 43. Liu et al discloses electrodes can be embedded in the substrate or disposed on the surface (Liu et al teach using more than one type of electrode), and as the deposition is electrolytic (electroplating) the electrodes must be coupled to a power source (refers to instant claims 5, 44, 45 and 50). As the areas to be plated correspond the electrodes (refers to instant claim 8). As plating is done electrolytically in a bath from salts in solution (refers to instant claims 9, 12 and 13), since SiO₂ can be use as a component of the substrate, (refers to instant claims 10 and 11 (see col. 12 lines 23-40 for example). Liu et al disclose the materials are applied in patterns. The reference apparatus is capable of delivering a variety of metals or metal alloys in lines approximately 6 microns thick (see col. 6, lines 9-13) (refers to instant claims 24 and 25). The

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reference discloses that the regions which can be plated may be wells (see figure 4c-d, and col 8 lines 20-33) (refers to claim 48).

15. Claims 1, 5-13, 24-25, 41, 42 and 50 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hunter et al (US 5,641,391).

Hunter et al teach an apparatus for micro fabrication which can apply many components from source materials including inorganic compounds (see col 9 lines 53-60 and column 3 lines 19-21) on to a substrate (see figure 1a). The apparatus has an assembly for spatially varying the electrical potential across the substrate (one or more electrodes, item 11 and col 5, lines 23-27). Applying potential to the electrodes causes the deposition of components of the source materials on to the substrate. Hunter et al also teach that one advantage of method of using the apparatus described in micro fabrication is the ability to make microstructures having a wide variety of geometries and wide varieties of materials to be constructed with a resolution dependent only on the ability to localize electrochemical deposition or etching (see col. 5 line 66-col. 6, line 5). This anticipates having different materials applied to different predetermined regions of the substrate. Hunter also teaches electro-deposition out of solution (figure 1a-d).

Hunter teaches that a voltage supply or a current source is connected to the electrode and substrate (see col. 8 lines 23-28). In that the Hunter teaches using multiple electrodes which can have different potentials applied, Hunter teaches the substrate and electrodes are coupled through the power voltage supply or current source (see col. 7, lines 50-60 and col. 10, lines 9-13).

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Hunter plates form a solution and indicates that materials such as CdSO_4 can be used in the inventions. In that Hunter set forth that the substrates can be semiconductors or polymers (see claim 10 for example). Hunter teaches that the apparatus can deliver numerous metals including the 26 listed at col. 9 lines 54-56. In that materials, especially metals can be electro-deposited (redox reaction) using electrodes as small as 5 nm. As the substrates utilized by Hunter are conducting substrates.

One might argue that Hunter does not anticipate the invention as Hunter does not actually prepare a substrate where two of the components in predefined regions are different. However, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to prepare a substrate having at least two of the components deposited at predetermined positions being different using the apparatus of Hunter et al because Hunter teaches that the apparatus described therein is for micro fabrication and can apply many components from source materials including inorganic compounds. One of ordinary skill in the art would have been motivated to do so in the process of microfabricating devices as taught by Hunter et al, as the reference teaches the ability to deposit a wide range of materials is particularly important in fabricating micro devices as they required numerous components (see col. 1, lines 32-36).

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16. Claims 1, 5-15, 24-25, 41-46 and 51-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Southern (WO 93/22480) or Southern (US 5,667,667) in view of Hunter et al (US 5,641,391).

Southern teaches an apparatus for applying a source material (electropolymerizable monomers and associated reagents for their application) to a substrate which has a potential assembly for applying a spatially varying electrical potential. See for example figure 2a-b. The application of current is used to cause appropriate monomers to undergo reaction where in different predetermined regions have different components deposited, see figures 1, 2 and page 10, line 25-page 11 line 26. The device is useful for the fabrication of devices carrying arrays of complex chemical substances, page 4 lines 24-36.

With respect to the dependent claims: Southern teaches that the substrate is in contact with an ionic solution as required by claim 9 and 13 (fig 2c and 2d), and that the substrate can be glass (example 1 on page 11). As the substrate is immersed in a solution, it must have an enclosure in which the substrate is housed as required by claim 12. As the apparatus of Southern comprises electrodes which are long strips which can alternately be used as anode and cathode, the potential varies from the cathode to the anode continuously across the entire length of the array. As the substrate is glass it is a resistive material as required by claim 15. As the material deposited can be applied as a square array of 256 material in less than 1 cm square (Figure 1). As the monomers (nucleotide precursors) are in solution and the source material undergoes a reaction which leads to the deposition of a monomer at defined location. In that the

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electrode array of Southern a series of electrodes in which any can be spatially addressed and set to any desired voltage, those electrodes not being used in the electrodeposition are reference electrodes. Last, it is noted that ions of the source materials undergo redox reactions at the predefined regions.

Southern teaches that the source material is nucleotides/ nucleotide precursors. In the alternative embodiment the source materials could be inorganic compounds. In addition to the teachings above it is noted that Southern teaches that the process and apparatus is useful for making small devices and that a wide array of chemical modifications can be envisaged including oxidations, reductions and that numerous devices including solid state devices can be made. The apparatus of Southern is also useful for the fabrication of devices carrying arrays of complex chemical substances. Southern teaches that the different effects of the array can be formed by altering the composition of electrolyte and the potential applied to the electrodes and the duration of the electrolytic pulse. However, Southern does not expressly recite the use of inorganic material to be deposited.

Hunter et al teach micro fabrication of devices by electro-deposition. Hunter et al teach the ability to deposit a wide range of materials is particularly important because micro devices required numerous components (see col. 1, lines 32-36). Hunter specifically teaches that a large number of inorganic materials can be electro-deposited including metal alloys and semiconductors.

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It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to electro-deposit inorganic materials taught by Hunter et al using an apparatus as taught by Southern and depositing the components simultaneously because Southern teaches different effects of the array can be formed by altering the composition of electrolyte and the potential applied to the electrodes and the duration of the electrolytic pulse and Southern teaches that the apparatus can be used to make arrays by electro deposition, and Hunter et al teach that numerous materials including inorganic materials can be electro deposited.

(While both references by Southern are cited independently, the relevant teachings are referred by line and page of the WO reference.)

17. No claims are allowed.


18. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to P. Ponnaluri whose telephone number is (703) 305-3884. The examiner can normally be reached on Monday to Thursday from 6.30 AM to 4.00 PM. The examiner can also be reached on alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jyothsna Venakt, Ph.D., can be reached on (703) 308-2439. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.


P. Ponnaluri
Patent Examiner
Technology Center 1600
Art Unit 1627
14 November 2000